



# UHC MAGNETIC LEVEL GAUGE

## Operating Manual

UHC-DT-JS-1027-2018(A)



## PREFACE

Thank you for choosing the products of Dandong Top Electronics Instrument (Group)-Co.,Ltd. This operation manual provides you with important information on installation, connection and commissioning as well as on maintenance, troubleshooting and storage.

Please read it carefully before installation and commissioning and keep it as part of the product near the meter for easy reading.

This manual can be downloaded by entering the version number at [www.ddtop.com](http://www.ddtop.com).

If the instructions are not followed, the protection provided by the meter may be destroyed.

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The performance specifications of the meter are effective as of the date of publication and are subject to change without notice. Dandong Top Electronics Instrument (Group)Co.,Ltd. reserves the right to modify the products described in this manual at any time without prior notice.

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Dandong Top Electronics Instrument (Group) Co.,Ltd. guarantees that all variable area flow meters have no defects in materials and manufacturing processes within one year from the date of delivery. During the warranty period, if the product returns with quality problems and the claim is determined by the manufacturer to be within the scope of warranty, Dandong Top Electronics Instrument (Group) Co.,Ltd. is responsible for repair or replacement of the buyer (or owner) free of charge. Dandong Top Electronics Instrument (Group) Co.,Ltd. is not responsible for the costs caused by improper use of equipment, labor claims, direct or subsequent damage and installation and use of equipment. In addition to the special written warranty certificate for certain products of Dandong Top Electronics Instrument (Group) Co.,Ltd., Dandong Top Electronics

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## Quality

Dandong Top Electronics Instrument (Group) Co.,Ltd. has passed the ISO9001 quality system certification. The whole process of product production is strictly in accordance with the scope of the quality system, providing the strongest guarantee for product and service quality.

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## 1. Safety Tips

For safety reasons, it is expressly prohibited to modify or change the product without authorization. Repair or replacement is only allowed to use the accessories specified by the manufacturer.

### 1.1 The explosion may cause death or serious injury.

When installing the device in an explosive environment, be sure to comply with applicable local, national and international standards, codes and regulations. Ensure that the equipment is installed in accordance with intrinsically safe or non-flammable site operating procedures.

### 1.2 Process leakage may cause serious injury or death.

If the process seal is damaged, the medium may leak at the connection.

### 1.3 Failure to follow the safety installation guidelines may result in death or serious injury.

All operations described in this manual must be carried out by trained and qualified or end-user-appointed personnel.

## 2. Product Descriptions

### 2.1 Main Structure

#### 2.1.1 Figure 1 –UHC magnetic level gauge side-mounted type

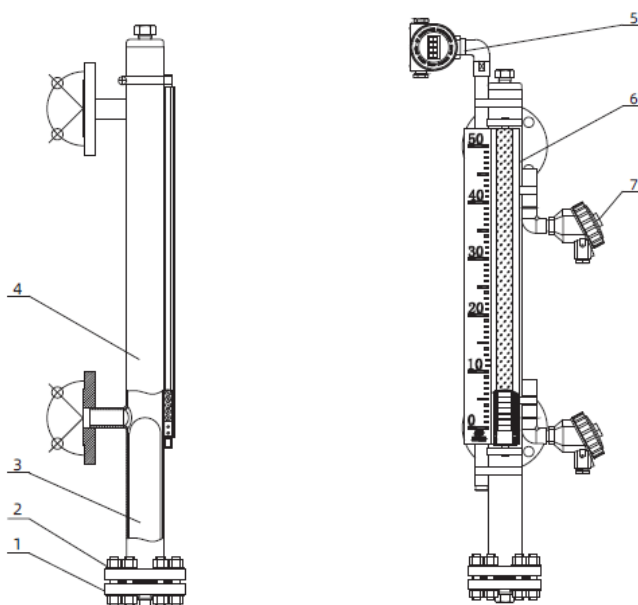


Figure 1 UHC Magnetic Level Gauge Side-mounted Type

1. Flange cover, can be equipped with sewage parts according to user requirements
2. Fasteners, including bolts, nuts, washers
3. Magnetic float, liquid level measuring element
4. Measuring tube, float chamber
5. Remote transmission device, long-distance transmission of liquid level signal, select according to customer requirement
6. Local indicarot, level indircator on-site.
7. Upper and lower limit level alarm, realize automatic control, select according to customer needs

2.1.2 Figure 2-UHC magnetic level gauge top-mounted type

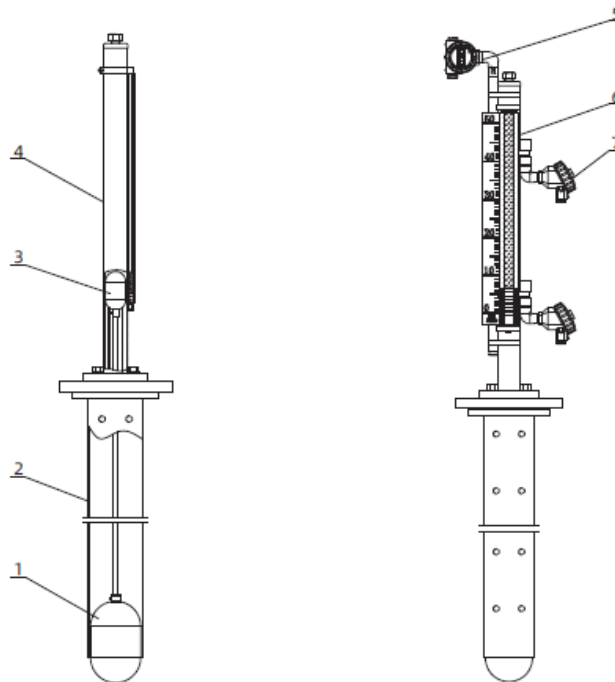


Figure 2 UHC Magnetic Level Gauge Top-mounted Type

1. Float, level measuring element-the first one
2. Stilling well, prevent the float from shaking with the medium
3. Measuring ball, level measuring element-the second one
4. Measuring tube
5. Remote transmission device, long-distance transmission of liquid level signal, select according to customer requirement
6. Local indicarot, level indircator on-site
7. Upper and lower limit level alarm, realize automatic control, select according to customer needs

## 2.2 Working Principle

UHC side-mounted type magnetic level gauge is connected to the process vessel through an interface flange to form a communicating device. The magnetic float in the measuring tube moves up and down with the change liquid level or interface, and the local indicator is driven by the magnetic steel in the magnetic float, which clearly and intuitively indicates the liquid level or interface in the process vessel.

UHC magnetic level gauge top-mounted type is directly mounted on the top of the vessel. The float moves up and down with the liquid level or the interface, and drives the magnetic connecting rod moves up and down. The magnetic steel in the float on the magnetic connecting rod drives the local indicator, which clearly and intuitively indicates the liquid level or interface in the process vessel.

UHC magnetic level gauge with remote transmission device. The magnetic float in the measuring tube moves up and down with the liquid level or interface level. The magnetic steel in the magnetic float makes the resistance value of the sensor circuit in the remote transmission device change linearly. Then the resistance change is converted into a 4-20mA standard DC signal through the converter circuit, which is displayed on the LCD screen or output to the control room through the output terminal, which facilitates the long-distance transmission of the liquid level signal.

UHC magnetic level gauge with upper and lower limit level alarm. The upper and lower limit level alarm is an independent set of alarm system hanging on the outside of the measuring tube. The alarm can be set intuitively through the scale on the local indicator. It can be equipped with multiple upper and lower limit liquid level alarms as needed to realize multi-point alarm. The magnetic float in the measuring tube moves up and down with the liquid level or interface level, and the magnetic steel in the magnetic float closes the reed switch in the upper and lower limit liquid level alarms to realize the alarm function.

## 2.3 Packaging

Please take the packaging waste to a special recycling facility.

## 2.4 Lifting and Transportation

Please use quality lifting equipment and lifting straps, and pay attention to safety.

## 2.5 Storage

Storage temperature  $-20^{\circ}\text{C} \sim 40^{\circ}\text{C}$

Storage humidity  $\leq 40\%$

## 3. Technical Parameters

### 3.1 Key Performance

3.1.1 The remote transmission device has passed the national explosion-proof certification

Certification mark: Intrinsically safe Ex ia II C T1 ~ T5/T6 Ga;

Flameproof Ex d II C T1 ~ T5/T6 Gb.

3.1.2 The upper and lower limit liquid level alarm has passed the national explosion-proof certification

Certification mark: Intrinsically safe Ex ia II C T1 ~ T5/T6 Ga;

Flameproof Ex d II C T1 ~ T5/T6 Gb.

3.1.3 Executive standard

GB/T 25153-2010 Magnetic level gauge for chemical pressure vessel

JB/T 12957-2016 Magnetic level gauge

### 3.2 Main Parameters

3.2.1 Local indicator side mounted type

Measuring Range	300 mm ~6000mm (> 6000mm special customized)
Nominal Pressure	0.6MPa ~ 25.0MPa
Nominal Diameter	DN25 or as customer requirement
Ambient Temperature	$-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$
Working Temperature	$-196^{\circ}\text{C} \sim +450^{\circ}\text{C}$ (only for local indicator)
Accuracy	$\pm 5\text{mm}$
Density	Level: $\rho \geq 0.35\text{g}/\text{cm}^3$ Interface: $\rho_1 - \rho_2 \geq 0.08\text{g}/\text{cm}^3$
Wetted Material	304, 316L or as customer requirement
Interface Flange	HG/T20592-2009, HG/T20615-2009 or as customer requirement



Standard	
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### Local indicator part top mounted type

Measuring Range	0~4000mm (> 4000mm special customized)
Nominal Pressure	≤2.5MPa
Nominal Diameter	DN150
Ambient Temperature	-40°C~+80°C
Working Temperature	-196°C~+450°C (only for local indicator)
Accuracy	±5mm
Density	Level: ρ ≥ 0.45g/cm <sup>3</sup> Interface: ρ <sub>1</sub> - ρ <sub>2</sub> ≥ 0.16g/cm <sup>3</sup>
Wetted Material	304, 316L or as customer requirement
Interface Flange Standard	HG/T20592-2009, HG/T20615-2009 or as customer requirement

### 3.2.2 Transmitter Part

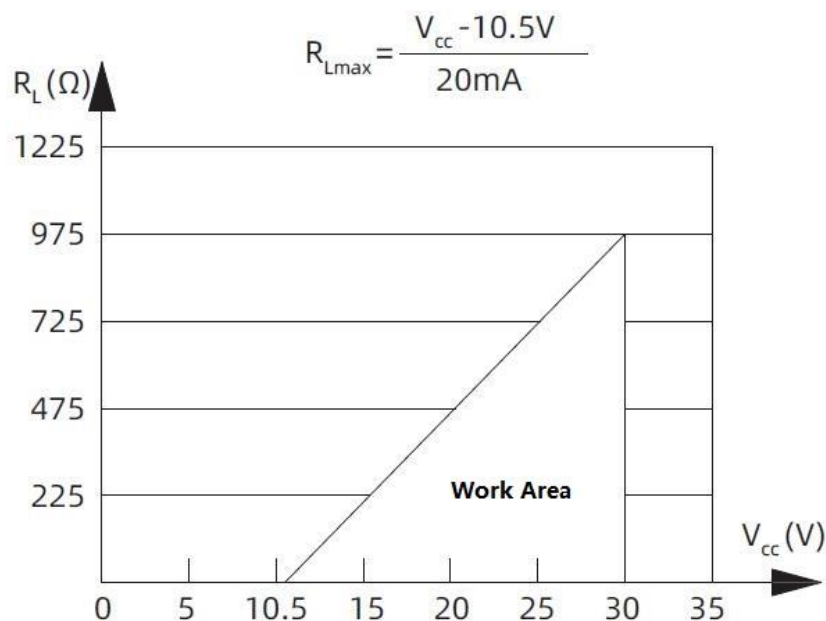


Figure 3 Load Characteristic Diagram

### 3.2.3 Upper and lower limit liquid level alarm (can be placed at any position within the range)

Output	— Normally open, — Normally Closed
Contact Rating	AC220VA, DC50W
Ambient Temperature	-40°C~+80°C
Medium Temperature	≤300°C
Power Inlet	M20×1.5 (female thread) or according to user requirements
Accuracy	±5mm

Life Span	$\geq 10^5$ times
Explosion-proof Type	Intrinsically safe Ex ia II C T1 ~ T5/T6 Ga Flameproof Ex d II C T1 ~ T5/T6 Gb
Ingress Protection	IP66

#### 4. Outline Diagram

Figure 4-UHC magnetic level gauge side-mounted type, if special size is required when ordering, the actual size shall prevail.

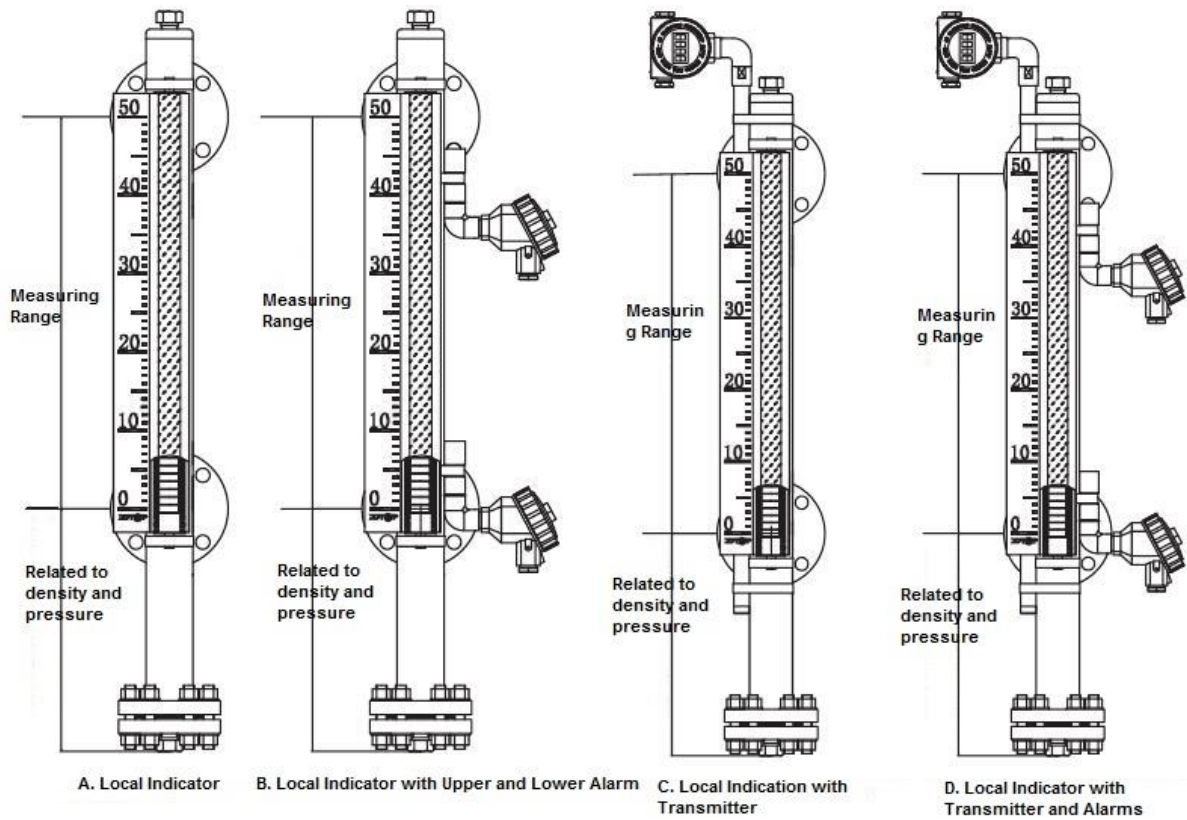


Figure 4 UHC Magnetic Level Gauge Side-mounted Type

Figure 5-UHC magnetic level gauge top-mounted type, if special size is required when ordering, the actual size shall prevail.

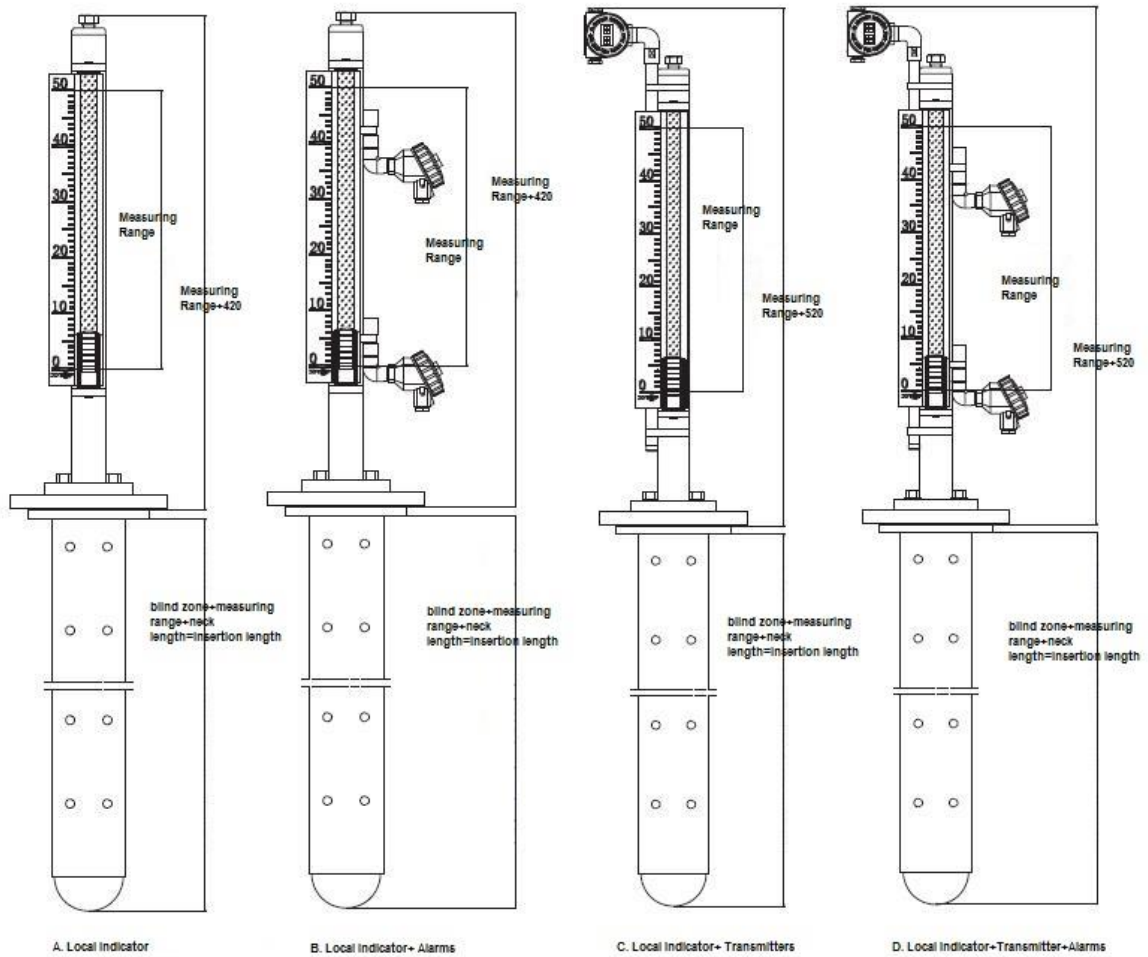


Figure 5 UHC Magnetic Level Gauge Top-mounted

## 5. Unpacking and Inspection

### 5.1 Precautions for unpacking inspection

5.1.1 Check whether the product nameplate is consistent with the packing list information

Figure 6-1 Side-mounted sign

Figure 6-2 Top-mounted sign

Figure 6-3 Transmitter sign

Figure 6-4 Alarm sign

		<b>Magnetic Level Gauge</b>			10F211-21	
<b>Product Model</b>						
<b>Measuring Range</b>	mm	<b>Nominal Pressure</b>		<b>Nominal Diameter</b>		
<b>Density</b>	g/cm <sup>3</sup>	<b>Working Temp</b>	°C	<b>Basic Error</b>	±5mm	
<b>Ingress Protection</b>	IP66	<b>Tag No.</b>				
<b>Manufacture Date/No.</b>						
Dandong Top Electronics Instrument (Group)Co.,Ltd						

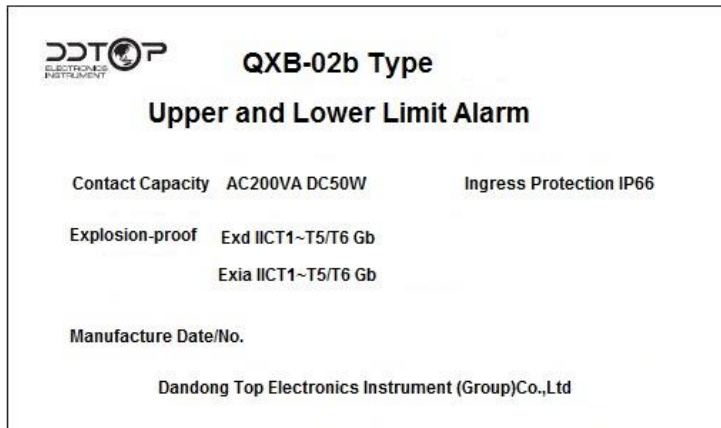
6-1 Side-mounted Nameplate

		<b>Top-mounted Magnetic Level Gauge</b>	
		10F211-21	
<b>Model</b>			
<b>Measuring Range</b>	mm		
<b>Nominal Pressure</b>			
<b>Nominal Diameter</b>			
<b>Density</b>	g/cm <sup>3</sup>		
<b>Working Temp</b>	°C		
<b>Basic Error</b>	±5mm		
<b>Ingress Protection</b>	IP66		
<b>Tag No.</b>			
<b>Manufacture Date/No.</b>			
Dandong Top Electronics Instrument (Group) Co.,Ltd			

Top-mounted Nameplate

		<b>UHC-Bb Transmitter</b>		10F211-21	
<b>Explosion-Exd II CT1~T5/T6Gb proof</b> <b>Exia II CT1~T5/T6Ga</b>	Power Supply 24V DC	<b>Range</b>	mm		
	Output 4~20mA	<b>Ingress Protection</b>	IP66		
	<b>Tag No.</b>	<b>Manufacture Date/No.</b>			
Dandong Top Electronics Instrument (Group) Co.,Ltd					

### 6-3 Transmitter Nameplate



### 6-4 Alarm Nameplate

5.1.2 Check the quantity and material of each part against the packing list.

## 5.2 Content of inspection

5.2.1 Check the appearance of the instrument for defects, damage and other abnormalities.

## 6. Installation

### 6.1 Installation Tools

6.1.1 Wrenches, flange washers and flange bolts for process connections.

6.1.2 Level (device)

### 6.2 Installation Technical Requirements

6.2.1 Please carefully observe whether the surface of the magnetic float is smooth and flat before installation, and make sure that the surface of the magnetic float has no damage such as dents.

6.2.2 When installing the side-mounted UHC magnetic level gauge, the axis of the flange on the measuring pipe side must be perpendicular to the horizontal plane.

When installing the UHC magnetic level gauge top-mounted type, the axis of the measuring tube must be perpendicular to the horizontal plane

6.3 Installation operation process-Figure 7-1, 7-2

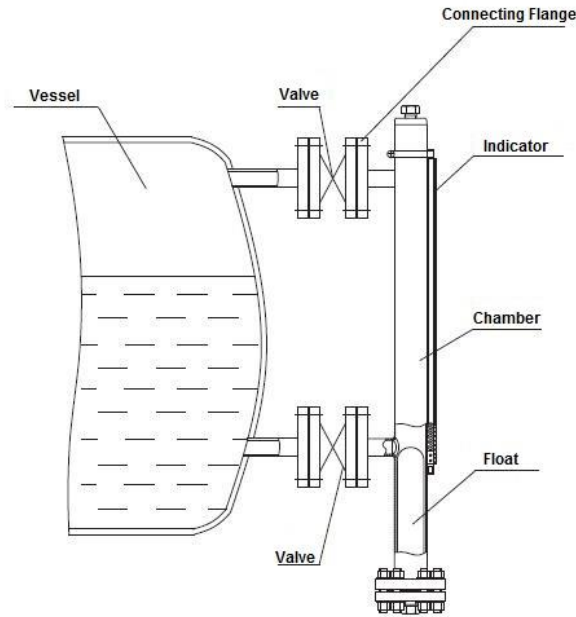


Figure 7-1 Installation process

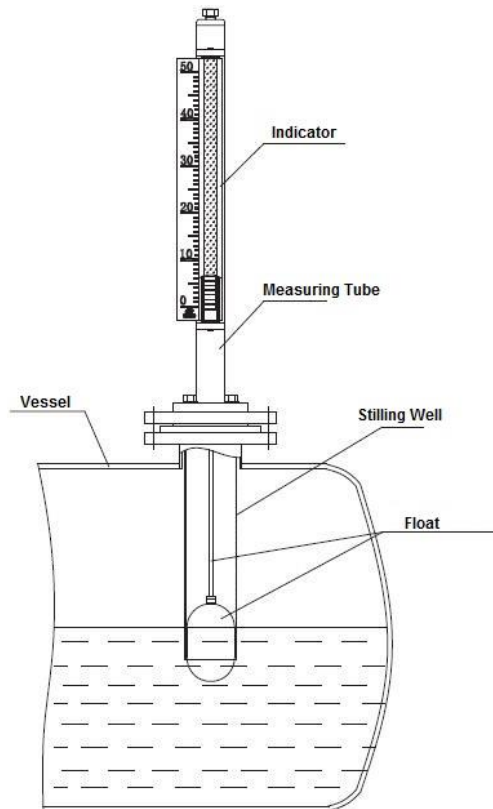


Figure 7-2 Installation process

6.3.1 Install the UHC magnetic level gauge side-mounted type, as shown in Figure 8-1, install the level gauge on the upper and lower valves connected to the process vessel, and ensure that the flange and the gasket are in good contact;

Install the UHC magnetic level gauge side-mounted type, as shown in Figure 8-2, first place the protective tube on the flange of the process vessel, and then install the rest on the protective tube. Ensure that the flange, the protective tube and the gasket contact well.

6.3.2 If the level gauge is equipped with a remote transmission device, complete the wiring of the remote transmission device as shown in the figure below-Figure 8

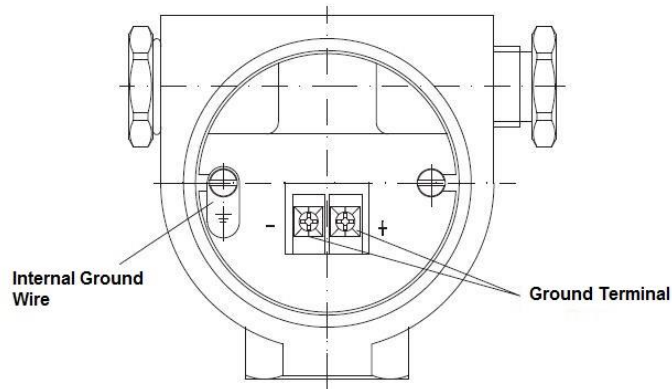


Figure 8 Remote transmission wiring diagram

6.3.3 If the level gauge is equipped with upper and lower limit level alarms, complete the wiring of the upper and lower limit level alarms as shown below: the upper limit is connected to the normally open point, and the lower limit is connected to the normally closed point-Figure 9

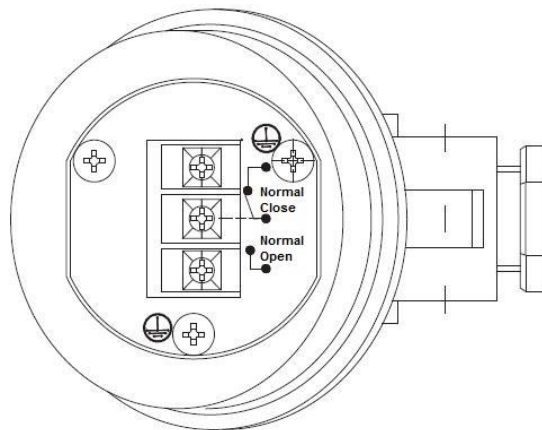


Figure 9 QXB alarm wiring diagram

## 7. Configuration

### 7.1 Transmitter Configuration

#### 7.1.1 UHC Magnetic Level Gauge Indicator Part Configuration

1) Configure with water as the medium (non-measured medium), the following two situations will appear:  $\rho_{\text{medium}} < \rho_{\text{water}}$  and  $\rho_{\text{medium}} > \rho_{\text{water}}$ . When  $\rho_{\text{medium}} < \rho_{\text{water}}$ , the liquid level



displayed by the flap will be higher than the actual liquid level. Because the actual size of the p medium is uncertain, the value higher than the actual liquid level is also uncertain. When  $\rho$  medium >  $\rho$  water, the float cannot float in the water and the flap will have no display. At this time, it can only be debugged in the actual medium;

2) configure with the measured medium, and observe that the actual liquid level is consistent with the flip panel display;

## 7.2 Transmission Configuration

This section mainly introduces how to use the 3 local keys (Enter key  $\leftarrow$ ), (up key "  $\uparrow$  "), (down key "  $\downarrow$  "), combined with LCD display to configure internal parameters.

### 7.2.1 LCD display function overview

See the full screen information (Figure 10-1). The variables that can be displayed on the LCD screen include current (Figure 10-2), percentage (Figure 10-3) and main variable (Figure 10-4). You can set to display a single variable, or you can set the percentage and the main variable to cycle display, and the effective digits of the decimal part can be set (0, 1, 2, 3, 4 decimal places). The display mode is set by 475 configuration software or keys. If the percentage and the main variable are displayed cyclically, the LCD will display these two variables alternately with a period of 3 seconds.

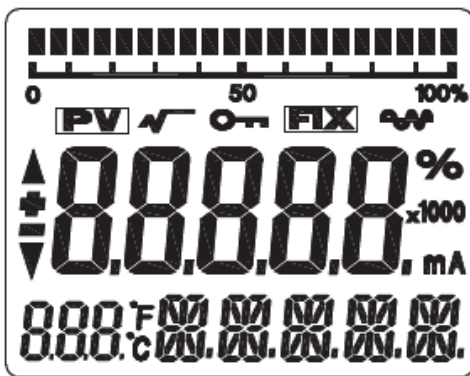


Figure 10-1 LCD Full Screen Display

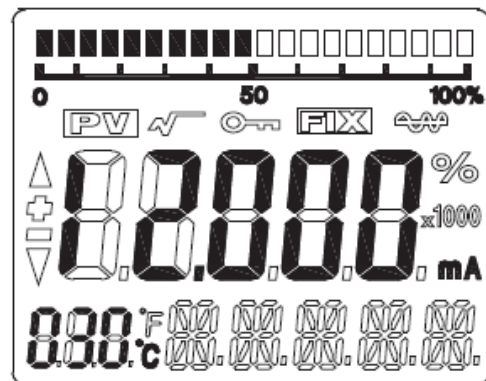


Figure 10-2 Current Display

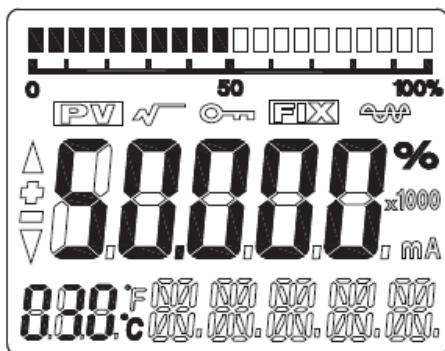


Figure 10-3 Percentage Display

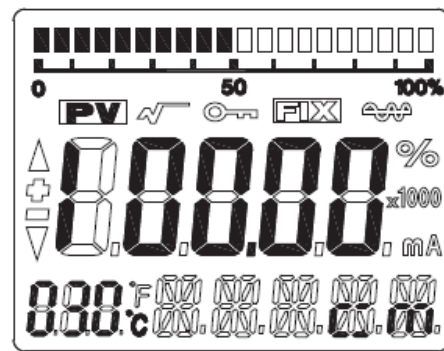





Figure 10-4 Main Variable Display



## 7.2.2 LCD display symbol description

- ① If it is in HART communication status, the symbol  on the right corner of the LCD screen will flash.
- ② If it is in root output, the LCD will display .
- ③ If a fixed output current is set, the LCD will display **FIX**.
- ④ If the write protection is activated, the LCD will display .
- ⑤ The three "888" display bits in the lower left corner of the LCD display the temperature of the electronic module and the menu number during configuration.

## 7.2.3 Button function description

There are a total of three buttons on the LCD panel. The three buttons are the enter key "←|", the down key "↓", and the up key "↑".

- The "↑" and "↓" keys are used to prompt the increase or decrease of data bits and the shift of the decimal point;
- The "←|" key is used to enter the prompt data setting interface and save the data.

## 7.2.4 Description of parameter configuration

Long press "←|" when the "888" character in the lower left corner displays 1 ~ 17, it indicates that the transmitter is in the field configuration mode with menu rotation. At this time, you can input the initialization code, modify the parameters, calibrate the instrument or perform migration by pressing the keys.

The data setting process utilizes:

- The "←|" key is used to select the digit and decimal point to be edited and confirm the final save.  
(Flashing is selected)
- The "↑" key is used to increase the flashing digits to cycle from 0-9 and move the decimal point to the right.
- The "↓" key is used to decrement the flashing digits to cycle from 9-0 and move the decimal point to the left.

The setting process is as follows:

(1) Long press the '←' key to enter the data configuration interface. At this time, the lower left corner displays '01', and the data line displays '00005'. When the '←' key is pressed again, the symbol bit starts to flash, indicating that the symbol can be modified Bit.

(2) If you press the '↑' key or '↓' again, you can switch the sign of the data.

(3) Press the '←' key again, the symbol is selected and the first digit starts to flash, indicating that it can be modified. Press for a long time or repeatedly press the '↑' key or '↓' to set the number between 0-9 between cycles.

(4) Press the '←' key again, the first digit is set and the second to fifth digits can be set in sequence at the same time. The setting method is exactly the same as the first digit.

(5) After setting the fifth digit, press '←' to start setting the decimal point. The decimal point starts to flash at the same time, indicating that the decimal point can be set. At this time, press the '↑' key or '↓' to move the position of the decimal point to the right or left to cycle through.

(6) After the decimal point is set, press the '←' key, the up and down arrows on the left will light up, indicating that the setting is saved.

(7) Press '←' again to restart setting data.

#### 7.2.5 Key function code quick reference table

When using button configuration on site, the two "888" display characters in the lower left corner of the LCD indicate the current setting menu number, which is the setting function performed by the current button. The corresponding relationship is:

"888" display in the lower left corner	Set variable
0 or empty	Normal Display
1	Format
2	Set unit

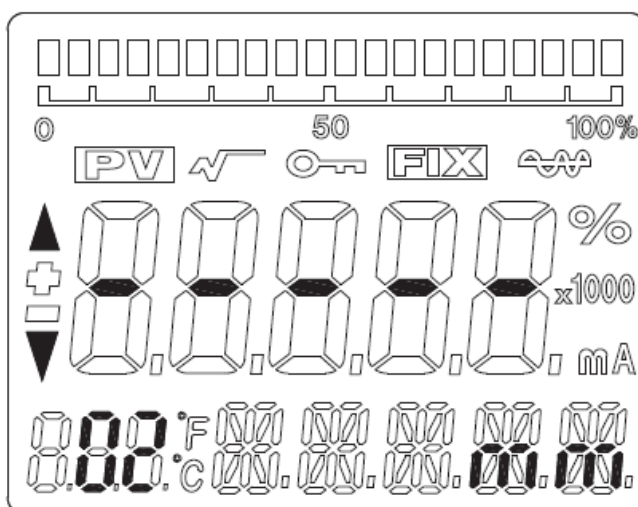
3	Set the lower limit of the range LRV
4	Set the upper limit URV
5	Set damping time
8	Density (standby)
9	Any point migration input compensation value, compensation value = P actual measurement - P pre-output
11	LRV calibration
12	URV calibration
17	View sensor value

The instrument calibration, upper and lower limits of range and damping setting can be completed as described in 7.2.4

### 7.2.6 Unit Setup

The units that can be set are: m, cm, mm, feet, and inch.

- ① Long press the '←' key to enter the configuration mode (first menu No. 1 is displayed, the up and down arrows on the left are lit).
- ② Press the "↑" key to switch the menu to No. 2, and the current unit symbol is displayed in the lower right corner.
- ③ Press the "←" key again, the unit starts to flash, and press the '↑' key or '↓' to switch to the unit you want to set.
- ④ Press the "←" key again, the unit setting is completed and the up and down arrows on the left will light up.



Unit Setup

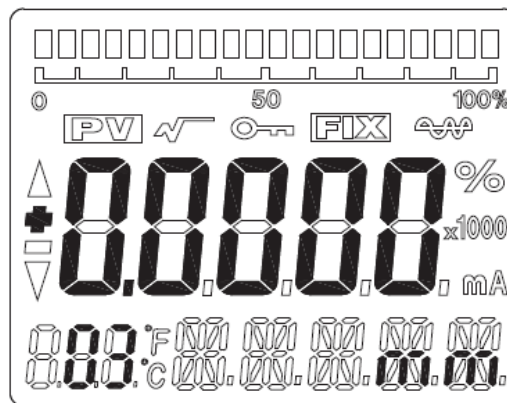
### 7.2.7 Range setting

Set the lower limit of the range LRV

- ① Long press the '←' key to enter the configuration mode (first menu No. 1 is displayed, the up and down arrows on the left are lit).
- ② Press the "↑" key to switch the menu to No. 3, and the LCD will display the current LRV value.
- ③ Press the "←" key again, and the symbol starts to flash. At this time, press the '↑' key or '↓' to switch to the sign you want to set.
- ④ Press the "←" key to complete the symbol setting and start to set the highest digit of the range. At this time, press the "↑" key or "↓" to increase or decrease the current flashing digit and press the "←" key confirm, set other digits and decimal points in sequence, and the menu item setting is completed when the up and down arrows on the left light up.

Set the upper limit URV

Switch the menu to No. 4, and the LCD displays the current URV value at the same time, and then repeat the steps ③ and ④ in 7.1.6 to set.



Range Setting

### 7.2.8 Damping setting

Switch the menu to No. 5, and the LCD will display the current damping value at the same time, and then repeat the steps ③ and ④ in 7.1.6 to set until the completion.

### 7.2.9 Two-point calibration

LRV calibration

- ① First adjust the PV value to the zero position

② Switch the menu to No. 11, and the LCD will display the current calibration position value at the same time, and then repeat ③④ in 7.3.7 to input the zero point value for zero point position calibration.

③ Press the "←" key until the up and down arrows on the left light up the zero position calibration is completed.

#### URV calibration

① First adjust the PV value to the full-scale position

② Switch the menu to No. 12, and the LCD will display the current calibration position value at the same time, and then repeat ③④ in 7.3.7 to input the full scale value for full scale position calibration

③ Press the "←" key until the up and down arrows on the left light up the full scale position calibration is completed.

#### 7.3.10 Move at any point

Menu '9' can realize any point migration function. The user can migrate the current PV value to any point within the range. (Enter compensation value) The setting process is as follows:

- ① Long press the "←" key to enter the configuration mode (first menu No. 1 is displayed, the up and down arrows on the left are lit)
- ② Press the "↑" key to switch the menu to '9' and the LCD will display the current PV compensation value
- ③ Press the "←" key again, and the symbol starts to flash. At this time, press the '↑' key or '↓' to switch to the sign you want to set.
- ④ Press the "←" key to complete the symbol setting, and at the same time the highest digit of the parameter to be set starts to flash. At this time, press the '↑' key or '↓' to increase or decrease the current flashing digit, and press the "←" key to confirm and start the next digit setting, and set other digits and decimal points in sequence. When the up and down arrows on the left side light up, the menu function setting is complete.

Compensation value calculation method:

Compensation value = PV actual measurement - PV pre-output

Note: The key configuration process will not automatically exit and it is needed to manually exit the key configuration. The method is to continuously press the '↑' key or '↓' key in the switching menu state to increase or decrease the menu. When the menu is greater than 17 or less than 1, exit the button configuration state and enter the normal output mode.

### 7.3 Configuration of upper and lower limit level alarm

When configure with water or actual medium, when the magnetic float passes the upper and lower limit liquid level alarms, connect the upper and lower limit liquid level alarms to the multimeter and check the on-off.

## 8. Precautions

- 8.1 UHC magnetic level gauge side-mounted before the line scanning or pressure test, the magnetic float should be taken out to prevent damage to the magnetic float during the line scanning or pressure test. After the line scanning or pressure test is completed, the magnetic float should be reinstalled. The gasket is replaced according to the usage;
- 8.2 When using the side-mounted UHC magnetic level gauge, you should first open the upper valve, and then slowly open the lower valve, so as to prevent the pressurized medium in the device from quickly entering the cylinder, causing the float to rise rapidly and causing the on-site indication to fail to track.
- 8.3 UHC magnetic level gauge top-mounted float and measuring ball installation process, pay attention to protect the connecting rod to ensure that it cannot be bent.
- 8.4 Make sure that the power supply is safe and reliable, and the power supply should be connected in accordance with the correct positive and negative poles;
- 8.5 UHC magnetic level gauge is not suitable for occasions with high vibration;
- 8.6 When the medium viscosity is  $\geq 10^{-4}$  (m<sup>2</sup>/s), it is inappropriate to use UHC magnetic level gauge;
- 8.7 UHC magnetic level gauge is not suitable to work in a strong magnetic field environment
- 8.8 After commissioning, tighten the display and power cover to prevent the meter from getting wet.

## 9. Fault Analysis and Troubleshooting

Fault analysis and troubleshooting	Cause of issue	Troubleshooting method
Local indicator has no display, remote transmission device has no signal output, upper and lower limit liquid level alarms do not alarm	<ol style="list-style-type: none"> <li>1. The liquid level is too low and the magnetic float has not floated</li> <li>2. The vent valve is not opened, the air pressure in the measuring tube is too large, and the liquid level cannot rise</li> <li>3. The magnetic float is too heavy to float</li> <li>4. The pressure is too high and the magnetic float is squeezed</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the system liquid level</li> <li>2. Open the vent valve and observe the on-site indicator display</li> <li>3. Confirm the density of the medium and contact the manufacturer</li> <li>4. Confirm the pressure and take out the magnetic float to see if it is crushed. Contact the manufacturer</li> </ol>
Local indicator has display, upper and lower limit liquid level alarm work, remote transmission device has no signal output or output is inaccurate	<ol style="list-style-type: none"> <li>1. The remote transmission device has no power signal input</li> <li>2. The components in the remote transmission device circuit detection board are damaged</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn on the power</li> <li>2. Replace the circuit detection board</li> </ol>
The local indicator has display, the upper and lower limit liquid level alarm does not work, and the remote transmission device signal output is normal	<ol style="list-style-type: none"> <li>1. The upper and lower limit liquid level alarm failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the upper and lower limit liquid level alarm</li> </ol>
Show CURFL	Loop current failure	<ol style="list-style-type: none"> <li>1. Is the grounding reliable</li> <li>2. Recalibrate</li> <li>3. The instrument circuit function is damaged</li> </ol>
Show CCSFL	Sensor failure	Sensor open circuit or circuit board failure

## 10. Disassemble

### 10.1 Warning

Before disassembling, pay attention to dangerous process conditions, such as pressure, high temperature, corrosive or toxic media in the container, etc.

Please refer to the instructions in the chapter 6.2 Installation Operation Process and 7.1 Electrical Wiring, and remove the components in the reverse order of the operation steps.

10.2 Waste removal  
Please follow the current regulations in each region for waste disposal.

## 11. Product Certification

Product Certification			
Certification		Certification No.	Certification Scope
PED		DGR-0036-QS-1217-19	Directive 2014/68/EU Annex III, Module H1
ATEX		Sira 19ATEX1146X	II 1G Ex ia IIC T5/T6Ga Ta = -40°C to 60°C  II 2G Ex db IIC T4...T6 Gb Ta = -40°C to 50°C/60°C/70°C
IECEX		IECEX SIR 19.0049X	Ex db IIC T4...T6 Gb Ex ia IIC T5/T6 Ga Ta = -40°C to 60°C for Ex ia Ta = -40°C to 50°C/60°C/70°C for Ex db
EMC		AE 50464663 0001	
Explosion-proof		CCRI 17.2056X CCRI 17.1001X	Ex ia II C T5/T6 Ga Ex d IIC T1~T5/T6 Gb
CCS Certification		DL17T0006_02	Ships and Mobile Offshore Units
Type Approval Certificate		10F211-21	